A NEW SARCOPHAGID SCAVENGER FROM MONTANA.*

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Sarcophaga cooleyi, n. sp.

Plate XXVI; figures 1, 2, 3 and 4.

Type, ♂ and ♀: Massachusetts Agricultural College.

Paratypes, ♂ and ♀: Massachusetts Agricultural College, four; United States National Museum, four; Montana Agricultural Experiment Station, six; collection of Dr. J. M. Aldrich, two; collection of writer, eight.

This species is rendered especially easy to separate from other North America members of the genus by the lack of marginal bristles on the third abdominal segment. *S. kellyi*, a much smaller species recently described by Prof. J. M. Aldrich (Journal of Agricultural Research, vol. 2, No. 6, Sept. 1914, pp. 443-445) is the only other native species with which the writer is acquainted that also lacks these bristles. The two species are at once differentiated by the presence of presutural acrostichal bristles and three rows of black cilia behind the eyes in *S. kellyi* Ald., while *S. cooleyi* lacks these bristles and has but two rows of cilia. Of the males *S. kellyi* has a grayish pollinose first genital segment, tinged with the reflecting colours of the abdomen, but the corresponding segment of *S. cooleyi* is dull orange, at most slightly grayish pollinose anteriorly. The female of *kellyi* has three sternopleurals, that of *cooleyi* four.

Length: 7 to 13 mm.; average 10 to 12 mm.

Male Head:—Viewed from side parafrontals and genæ with dark reflections. Breadth of front at narrowest part about three-fifths eye width; cheek height approximately one-half that of eyes. Front prominent, upper inner orbits of eyes converging downward; sides of frontal vitta not drawn in at base and usually converging backward by slight curves. Second antennal segment dark, its tip sometimes slightly brownish; third segment two and one-half times length of second; arista plumose on basal one-half to two-thirds. Back of head somewhat convex, with two rows of black cilia behind eyes, otherwise clothed with whitish, silvery white, or sometimes faintly yellowish hair. Cheeks clothed with black

*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College.

hair. That half of genæ nearest eye-orbits with scattered hairs arranged in two or three irregular rows, a few stouter ones just above transverse impression. Palpi dark.

Chætotaxy.—Lateral verticals absent; vibrissæ inserted just above line of oral margin.

Thorax.—Vestiture of metanotum consisting of short, slightly reclinate, bristly hairs. Sutural ridge with a few scattered hairs behind last notopleural bristle. Hairs covering anterior spiracle mostly yellowish gray, but their bases dark forming an irregular band; those on anterior margin of posterior spiracle dark brown; spiracular cover pale yellowish. Epaulets dark.

Wings.—Bend of fourth vein normally a little less than a right angle; anterior cross-vein much more basal than end of first longitudinal; third vein bristly; costal spine vestigial; section V of costa about one half length of section 3; alulæ fringed with hair; calyptræ whitish, outwardly fringed with white hair.

Legs.—Dark. Posterior trochanter hairy, without a distinct "brush"; in profile a slender spine can often be seen distally on the ventral surface but is usually obscured by hair and may be absent; femur sub-spindle shaped, sometimes very slightly arched, clothed beneath with long, fine hairs that both anteriorly and posteriorly form a sort of beard, anterior face with three rows of bristles, those of the intermediate row short and stout, not present distally; tibia usually slightly curved, anterior and posterior faces each with a beard of equally dense, long, coarse, black hairs on distal four-fifths; tarsus shorter than tibia, the fourth segment longer than one-half-fifth. Middle coxa with a single row of bristles; femur clothed beneath on proximal one-half to two-thirds with a beard-like growth of long, fine hairs, anterior ventral row of short, scattered bristles complete, posterior row represented only by a distal comb extending proximally to the long hair. Anterior coxa with two rows of bristles.

Chætotaxy.—Anterior dorsocentrals strongly reclinate, but projecting well above short vestiture of prescutum; acrostichals absent, though most posterior pair is rarely weakly developed; inner presuturals absent, or if present inconspicuous; four or five pairs of postsutural dorsocentrals, two posterior pairs that are long

and two or three anterior that are short and weak; prescutellar acrostichals present: scutellar apicals present; three sternopleurals: lower sternopleurals consisting of a single row of strong bristles and numerous other irregularly placed bristles anterior to it.

Abdomen.—Somewhat conical, clothed above with short decumbent bristles, beneath with short almost erect hair. Ventral plates, as a whole, with their sides converging posteriorly, the first bearing long erect hairs, vestiture of second and third short and decumbent except at sides and posterior margin, first usually trapezoidal, its sides slightly converging posteriorly. Fourth plate prominent, in profile its base with a large somewhat conical elevation posteriorly, posterior inner edges of lamellæ bent inward and each with a "brush" of very densely set, short, stout, blunt spines on proximal half.

Chætotaxy.—Second and third segments without marginal bristles, fourth with a complete row ending ventrally at forward turn of margin.

Genital Segments.—Prominent, dull orange. First, usually concealed to just beyond "humps"; in profile slightly convex; faintly yellowish pollinose dorsally, anterior portion including "humps" sometimes slightly darkened, rarely the entire segment; clothed with short hair, "humps" bare; marginal bristles present, three to five on each side of centre: second, rotund, not flattened; vestiture longer than that of first; anal area of medium size, extending upward at least to centre of posterior surface. Forceps darkened, inner edges of prongs approximated to about the middle then slightly separated; tips blackish, bent forward and slightly spread apart; clothed with short hair nearly to prong tips, longest at sides; base with upward flap-like extensions.

Genitalia.—Head of penis large, distinctly marked off from base on posterior surface by a narrow band of membrane. Accessory plates hairy.

(♀) Females differ from males in the following important points:

Head.—Breadth of front at narrowest part slightly greater than eye width. Inner orbits of eye on upper part of front diverging downward.

Chætotaxy.—Lateral verticals and two orbital bristles present.

Thorax.—Sutural ridge bare.

Wings.—Angle formed by bend of fourth vein slightly more acute than in male.

Legs.—Vestiture throughout of short hair. Spine of posterior trochanter distinct, anterior face of femur with but two rows of bristles, an upper and lower, a few bristles proximally and posteriorly on ventral face. Middle femur with "comb".

Chætotaxy.—Scutellar apicals absent; four sternopleurals; lower sternopleurals fewer and anterior ones more distinctly bristly.

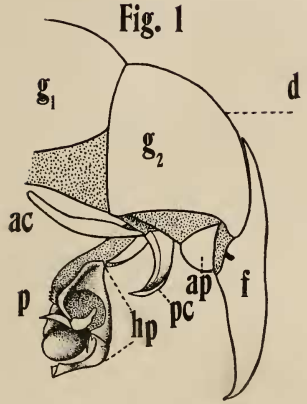
Abdomen.—Oval; vestiture throughout of short reclinate bristles. Posterior margins of ventral plates each with a row of bristles.

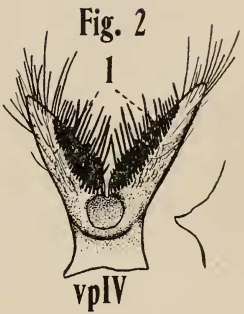
Genital Segments.—Protuberant. First segment consisting of two lateral lips that converge dorsally meeting in a slight depression and ventrally are separated by fifth ventral plate which they sometimes overlap, on dorsal half their edges with a row of close set, strong bristles that converge backward and downward, tips of uppermost usually crossing, each bears short hairs just in front of posterior edge, spiracles slightly above centre. Spiracles of fifth segment plainly visible.

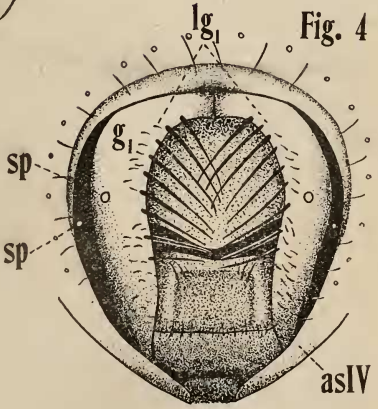
Described from 13 ♂ and 13 ♀ specimens. About 500 examined.

Range.—Collected at Laurel and in the Bridger Mountains, Montana.

The colour of the parafrontals and genæ is usually faintly aurichalceous, sometimes silvery gray, the deeper reflections when viewed from the side vary from brown to deep gray. In a single male specimen the lateral vertical bristles were weakly developed. The abdomen of ♂ often appears more oval than conical, but the latter is more typical. Ordinarily the vestiture of the second ventral plate is decumbent like that of the third, but occasionally may be a little more erect. As seen when the abdominal segments are in their normal position the sides of the second and third ventral plates appear almost straight, but when the segments are separated, as so often happens when the genital segments are being pulled forth and fixed in position, these two plates are fully exposed; they then appear subcircular. The membranous area at







SARCOPHAGA COOLEYI, N. SP.

the base of the lamellæ of the fourth ventral plate is very prominent forming the posterior face of the somewhat conically raised extremity of the base. The "brushes" of the lamellæ are prominent even when the genital segments are in their normal position, and may be seen filling in the space between the forceps and the ventral portion of the fourth notum. The marginal bristles of the third abdominal segment which are present in most species of Sarcophaga, are lacking, though sometimes a few, short, decumbent bristles may be discerned. If the penis is examined a weakly chitinized projecting process is seen extending upwards from the dorsal, distal portion. This bends abruptly forward and divides in to a Y. When specimens are fresh, a profile view shows this process raised above the penis head, but when dry it is often applied to it. The four sternopleurals of the female are distinctive.

S. cooleyi is very closely related to an undescribed species, the same mentioned by Dr. Felt in his annual report for 1912 (New York State Museum Bulletin 165, pp. 80-82), under the name of *S. georgina* Weid., a synonym of *S. hæmorrhoidalis* Meig. This undescribed species has a wide distribution throughout the United States.

While engaged on investigation for the Montana State Board of Entomology during the past summer, the writer bred this species extensively from decomposing fish. It was also captured in privies and was common around garbage, especially if the latter contained fish. In one experiment, in which two hundred larvæ were used to determine the length of the larval stages, not a single adult emerged but numerous chalcid parasites were raised from the pupæ.

Explanation of Plate XXVI.

(All drawings made with camera lucida).

Fig. 1. Side view of genital segments of male showing penis forceps, anterior and posterior claspers accessory plate.

Fig. 2. Ventral view of fourth ventral plate and profile view to show elevation at posterior extremity of base.

Fig. 3. Posterior view of forceps.

Fig. 4. Genital segments of female (made from a specimen with genital segments partly expanded).

ac. Anterior claspers.
ap. Accessory plate.
as IV. } Fourth and fifth abdominal segments.
as V. }
bvp. IV. 'Brush' of fourth ventral plate.
d. Dorsal limit of anal area.
f. Forceps.
fpg. Forceps prong.
g. 1. First genital segment.
g. 2. Second genital segment.
hp. Head of penis.
l. Lamellæ of fourth ventral plate.
lg. 1. Lips of first genital segment (♀).
p. Penis.
pc. Posterior claspers.
sp. Spiracle.
vp. IV. Fourth ventral plate.

A NEW ELACHISTID MOTH FROM MANITOBA.*

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Among some micros collected at Aweme, Man., by Mr. Norman Criddle, Field Officer of the Dominion Entomological Service, are two specimens of a species of *Heliodines*, of the family Elachistidæ, which is undescribed. The specimens were reared by Mr. Criddle from larvæ found feeding on *Oxybaphus nyctagineus*, a widely occurring representative of the *Nyctaginaceæ* in Canada. I therefore propose the name:

Heliodines nyctaginella, sp. nov.

Antennæ dark metallic grayish-purple. Palpi pale yellow, tipped with black. Face, head and thorax blackish, shining; thorax with greenish reflections. Fore-wings bright golden-orange, with nine metallic bluish-gray, more or less elongate, spots, six costal and three dorsal, all edged with black basally. Base of costa and margin of dorsum to first dorsal spot black. Space

*Contributions from the Entomological Branch, Department of Agriculture, Ottawa.
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